TRANSPORT AND MOBILITY CONSTRAINTS IN AN AGING POPULATION: health and livelihood implications in rural Tanzania

Abstract

This paper presents findings from a recent study of the transport and mobility constraints faced by older people in 10 settlements in Kibaha district Tanzania. It is concerned, in particular, with the interconnections between transport, health and livelihoods. The study is innovative in two respects: firstly, because it is presents a rare examination of older people's mobility issues in a developing country context; secondly because it draws on an innovative methodology of co-investigation with older people as peer researchers. The paper demonstrates the diverse ways in which older people's health, livelihoods and access to transport are interconnected, the growing importance of motorcycle-taxi services for rural connectivity, and how the relationality between older people and younger generations contributes to the shaping of mobility patterns.

Key words: older people, mobility, transport co-investigation, motorcycle-taxis, generational linkages, Tanzania

Introduction

Interest in aging and mobility has grown substantially in recent years, as a recent special issue editorial in this journal observes (Schwanen, Paez 2010). This paper presents findings from a study of the transport and mobility constraints faced by older people in 10 settlements in Kibaha district Tanzania. It is concerned, in particular, with the interconnections between transport, health and livelihoods. The study is innovative from two perspectives: firstly, because it presents a rare examination of older people's mobility issues in a developing country context[1], and secondly because it draws on an innovative methodology of co-investigation with older people as peer researchers, within a mixed-method approach. It also draws attention to the implications of older people's transport and mobility constraints for a much wider population.

Older people form a key component of African populations, especially in the era of HIV/AIDs, which in many countries has left grandparents supporting and caring for grandchildren (HAI 2007). There are approximately 2 million orphaned and vulnerable children in Tanzania: 50% of these are in households headed by older people, predominantly older women (Unicef 2006). In HIV/AIDS and other contexts, many older carers lack financial support from the child's parents and struggle to provide for children in their care[2]. Although there is a growing literature on this role of older people as carers (e.g. Ingstad 2004; Schatz, Ogunmefun 2007; HAI 2007; Kamya, Poindexter 2009, Ssengonzi 2009), the mobility constraints older people face – which impact strongly on their ability to act effectively in this role - constitute a major knowledge gap.

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[1] Ipingbemi 2010 and Pettersson, Schmokker 2010 present rare (urban-focused) studies.

[2] In a recent study (www.dur.ac.uk/child.mobility), approximately 20% of 3000 child respondents surveyed live with people other than their parents. In South Africa, Malawi and Ghana respectively, 14%, 9% and 9% live with grandparents (usually grandmother alone); the remainder lived with other relatives/foster parents, many of whom are older people.

Mobility, or lack of it, is likely to be implicated in many facets of older people's lives. Health concerns almost inevitably grow with age and regular access to health services tends to become increasingly important; access to livelihoods is another common concern. Income poverty is a widespread characteristic of Africa's older people, especially where government measures do not provide universal social security coverage in old age (Barrientos, Gorman, Heslop 2003; Aboderin 2004): family support for them has been assumed. In the current context of lack of old age social security, continuing access to livelihoods is frequently vital, not just for the elderly to support themselves, but also to support young orphans and others in their care (Clacherty 2008). Accessing a secure livelihood is often particularly difficult for older people: in rural areas income from farming is frequently insecure, and likely to become more so with climate change. Multiplex livelihoods and off-farm income are widely recognised as a route out of rural poverty (Bryceson 2002) but livelihood diversification often requires travel beyond the immediate neighbourhood.

We can hypothesise that availability of transport and personal mobility potential will substantially affect older people's access to key facilities and services, with significant impacts on their health and well-being. Long walks to access a transport route, or to services, are likely to present a serious hurdle to less fit/disabled older people, especially where the route crosses difficult terrain, or in the rainy season. Research suggests that even in larger settlements, distances to required services may be so long and transport so infrequent that access is low (Grieco et al. 1996, Ipingbemi 2010, Porter 2011). Where regular transport is available, low incomes and poverty may still limit access. Older people, especially women carers, often appear to be among the poorest (Kakwani, Subbarao 2007), and thus among the least able to afford transport fares.

Our field research in rural Tanzania demonstrates the strength of the interconnections between older people's access to transport, health and livelihoods. Good health enables older people to work to support themselves and those in their care while, at the same time, access to livelihoods may provide the funds to pay for health care. Access to good health care is likely to bring improved well-being and to enable many to work well into their 70s, an important factor in communities where the caring role of older people is so significant. And, as we show, both access to health and secure livelihoods depend to a considerable degree on access to transport.

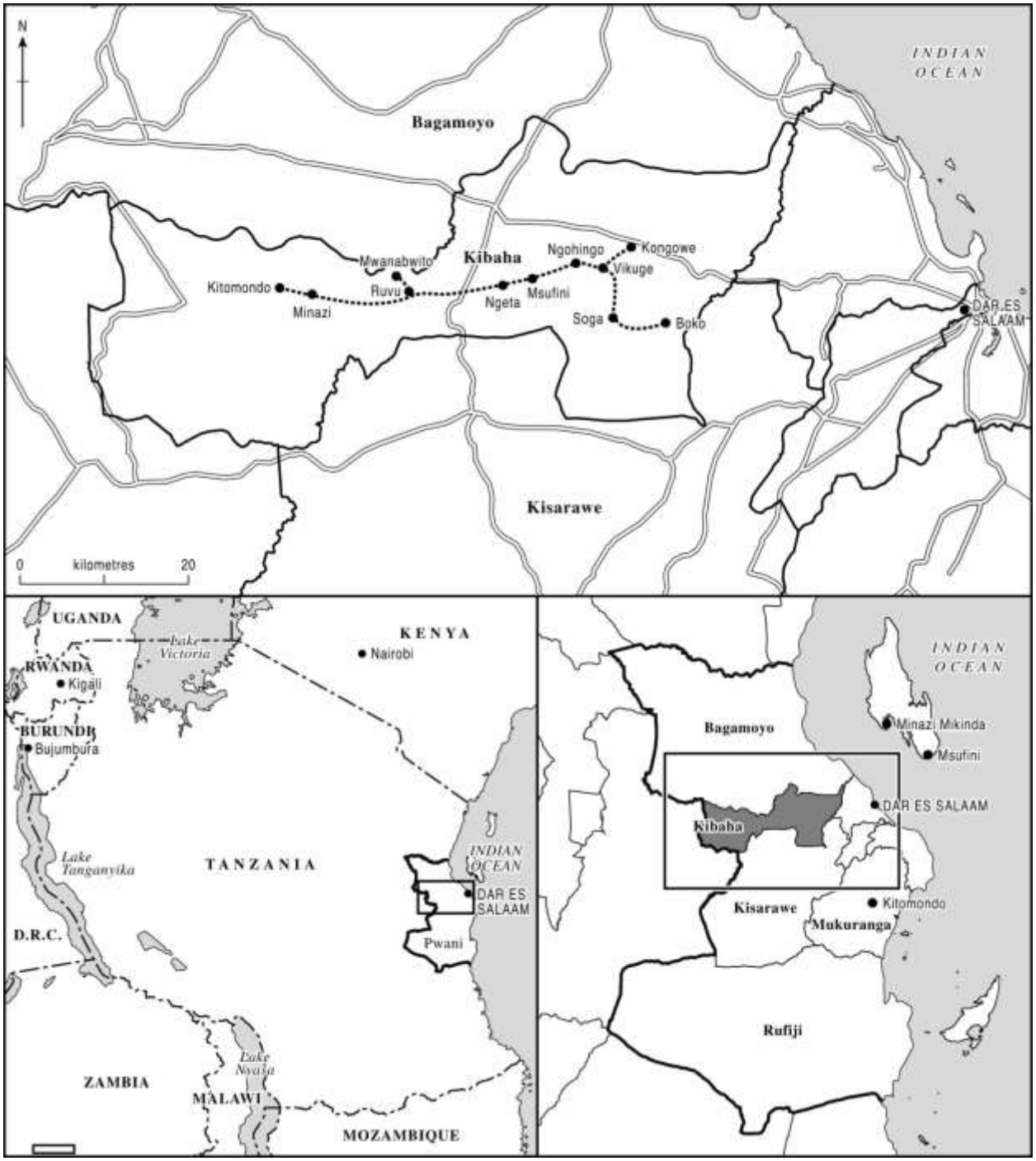
We commence with background information on Kibaha district and our methodology. Following a brief review of older people's living conditions, we examine their health-seeking behaviour, the livelihood implications of poor access to health and other services, and how health and transport issues interact with wider livelihood factors.

BACKGROUND: KIBAHA DISTRICT CONTEXT AND THE FIELD METHODOLOGY

The study is focused on rural settlements in Kibaha district with varying service and access characteristics: one village located on the paved road (Kongowe); 5 villages located off-road[3], with a clinic; 4 villages located off-road, but with no clinic (Fig. 1).

Fig. 1: Kibaha district and the study villages

[3] i.e. Away from a paved or good gravel road.



The field methodology had three key strands:

Co-investigation through older people community peer research: Twelve older people (60y+) (8 men, 4 women) were trained as peer researchers (henceforth OPRs) during a one-week workshop designed to build their skills. Their workshop feedback and subsequent (74) peer field interviews informed design of our qualitative checklists and survey questionnaire. Co-investigation, previously used by the lead author to investigate the mobility problems of

children/youth (see XXX), proved very effective in this context: it has considerable potential for mobilities research with commonly excluded groups.

Qualitative research: 194 qualitative interviews were also conducted by four young local research assistants (RAs), with checklists drawn substantially from findings of the OPRs and some preliminary field research. They interviewed older men and women in each settlement, plus some key informants, notably clinic staff and transport operators.

Quantitative survey research: A small survey was administered by the RAs to older people in all study villages: we aimed for a minimum of 30 completed questionnaires per settlement, but in some villages the total number of older people was under 30. In total 339 valid questionnaires (61% female, 39% male) were obtained[4].

Qualitative interview data from OPR and RA interviews were analysed thematically and information for key themes triangulated with findings from the (SPSS) survey data analysis.

TRANSPORT, LIVING CONDITIONS AND ACCESS TO HEALTH SERVICES IN THE STUDY SETTLEMENTS

Road access and transport availability in the nine off-road study settlements is difficult, especially in the wet season, and transport services extremely sparse (with the exception of motorcycle-taxis which, as we discuss below, have transformed overall perceptions of access over the last few years – see Appendix 1). Fuel, electricity, drinking water and sanitation availability also have important transport implications and significantly affect older people's lives. The vast majority of older people surveyed (94%) depend on wood for their main source of fuel; 97% have no electricity available in their house. Poor availability of drinking water is another widespread problem (with the exception of the roadside settlement, Kongowe): only 2% have piped water to their dwelling, 9% to the compound. Water and firewood have to be carried on foot to most houses.

Living arrangements also impact strongly on older people's well-being. Those living alone (women 12.1%, men 10.6%), or caring for orphaned grandchildren, tend to be the most vulnerable. It was difficult to confidently calculate the proportion of sole carers of children under 18 years, since many who said they were then listed their adult children as present within the same household. In some cases this appears to be because the grandchildren for whom they care belong to a different child; nonetheless, this was the least satisfactory element in the survey.

The questionnaire survey captured many aspects of older people's use of health services in the 10 settlements. Only six settlements have clinics. In the month prior to the survey, 38% of women and 47% of men had visited a health centre; in the previous year, excluding the last month, respective figures were 46% for women and 34% for men. Some (women 14%, men 18%) had not used health services for over a year. Lowest usage figures for the month prior to

[4] Age distribution: 60-65y=31.9%; 66-70y=16.8; 71-75y=15.6; 76-80y=14.7; 81-85y=7.1; 86-90y=9.1; 91-95y=2.4; 95+=2.1 Marital status: under 1% single, 47% married, 40% widowed, 12% divorced

the survey were in the two remotest settlements, Minazi (26%) and Kitomondo (31%), neither of which has a clinic.

Respondents who had used health services within the last year were asked their reason for going, to which health centre they travelled, and the time it took to get to there. The main stated reasons for seeking health advice/treatment were: malaria (17%), swollen joints/leg problems (11%), 'fever' (10%), blood disorders (9%) digestive problems (8%) waist/back pain (6%). Surprisingly, diabetes was recorded as the direct cause of a health-seeking visit by only two people, though it is clear from in-depth interviews that diabetes is a common illness among older people. The majority used their local clinic/dispensary (women 62%, men 66%) and took between 15 and 45 minutes to reach it (table 1).

Table 1: Time taken to reach clinic on most recent visit

	Under 15 min	**16-45 min**	**46-90 min**	**91-180min**	**181-240 mins**
Women	13%	42%	19%	7%	5%
Men	19	42	12	19	8

In all age groups, the *dominant travel mode* was walking or motorcycle-taxi (the only motorized transport widely available), with walking journeys predominating in most locations. Nearly half walked (women 47%, men 46%), while 29% of women and 23% of men travelled by motorcycle-taxi; 4% of women and 5% of men by bus; 3% of women and 6% of men cycled and just 3 women travelled by bicycle-taxi.

For many older people walking is the only option, despite infirmity, because of the cost of transport: *I have problems with my leg so I can't walk far. Even going to the nearby clinic, I can sit four times ..... I also have asthma so when I walk I have to use a stick. So most of the diseases, because of poverty, sometimes you feel that God doesn't love us* (Woman 80+y, Vikuge). There was one clear variation to that general pattern of travel to clinic: this was in the roadside settlement, Kongowe, where only 16% walked, while 31% used the bus, 25% motorcycle-taxi and 22% minibus. More transport is available in this large settlement at the paved road and bus travel is both more comfortable and cheaper than by motorcycle-taxi, which explains its dominance.

All respondents were asked what they viewed as difficulties in seeking health treatment. Fees to see the doctor (user fees) and medicine costs were a problem for 59% of women and 64% of men. Travel *difficulty* was raised by 47% of women and 48% of men, while 35% of women and 39% of men referred to travel *cost*. Health service quality was a problem for 20% of women and 26% of men; preference for traditional treatments was expressed by 17% of respondents (being reportedly a last resort when older people have no funds for travel, or when hospital treatment has been ineffective).

Respondents were then asked what was their *principal* difficulty in accessing health services (table 2).

Table 2: Principal difficulty in accessing health services

	None	Travel difficulty	Travel cost	No one to accompany	User fees/medicines cost	Quality of service	Preference for traditional healers etc.
Women	31%	9%	5%	3%	37%	5%	6%
Men	37	7	6	2	31	11	3
Total	34	9	6	3	35	8	5

User fees clearly dominate as the most important barrier, with travel difficulties and cost of travel lower down the scale. By settlement, travel *difficulties* were particularly important in Ngeta (21%), despite the fact that it has a clinic. Even if a village has a clinic, many residents will live at a distance from it. If referral is needed to a hospital, the travel hurdle is even greater. Moreover, even after older people are attended to at their local health centre, there may be a need to travel elsewhere to obtain medicines: *They can say, 'go and buy medicines. We don't have medicines here.'* (Woman c.80y, Vikuge)

W*e do not have enough medicine and we do not have a pharmacy here - people have to go to Kibaha mailimoja which is about 4000sh one way (by motorcycle-taxi)…to get some medicine.* (Clinical officer, Soga dispensary)

Clearly, where travel difficulties and travel costs compound high user fees, the barriers to health service access are enormous. Such costs may put an older person or their family into serious financial difficulties. The issue of health centres charging for services that older people are supposed to receive without payment was a frequent complaint: *Free medical service is spoken about but not practiced – it's political rather than practical!* (Settlement leader).

In those villages without a clinic, many older people simply do not bother to attempt travelling to obtain treatment. In Minazi, for instance, there is only a seasonal road and, during the rainy season, there are impassable sections on the black cotton soils. *In the rains even the boda-boda doesn't go. You have to carry the sick person on your back and ferry them across the stream till you get to where the boda-boda is available*. Transport to the nearest small dispensary costs 2000 sh. but if a hospital visit is needed after 7pm it costs 10,000-15,000: *You have no choice. You may call the ambulance …but you pay fuel 20,000 so the boda-boda is cheaper (and) you still need money to get treatment.*

When a patient is very ill, or infirm, motorcycle-taxi travel is particularly difficult and the assistance of an extra passenger is essential (though travelling with two passengers is against the law)*: I went with the bodaboda (to the dispensary) but I couldn't sit on my own - one person has to sit at the back to hold me due to the back pains I have.* (Woman 77y, Mwanabwito)

Family members often pay for transport of their elderly relatives in health emergencies, though if there is no family, the wider community may provide assistance, especially in remoter villages: *During emergencies the community helps so they will ask the boda-boda owner not to charge immediately – you pay later. ... The majority of the people in the neighbourhood will contribute …. contribution (kiahanga) is a must. You have to be aggressive in collecting the funds- you*

*insist they should do so in case it happens to **them**. So they go inside and fetch the money.* (Settlement leader, Kitomondo).

Clearly, transport cost and availability significantly affect health-seeking behaviour. Even in settlements with clinics, residential location and other factors such as infirmity may impede access. Moreover, presence of a clinic does not necessarily imply availability of required medicines or treatment.

LIVELIHOOD IMPLICATIONS OF POOR ACCESS TO HEALTH AND OTHER SERVICES

Without old age social security, continuing access to livelihoods is frequently vital, not just for older people to support themselves, but also to support young people in their care. For many older people, health problems bring substantial associated livelihood problems. In particular, these problems are associated with the domestic load carrying which is necessary in order to maintain the household and enable people to go about their daily business of making a living. Unless children or grandchildren are available to assist on a regular basis, these transport tasks – carrying water, firewood, food from the farm etc. - present a major hurdle.

Income sources among older people are dominated by farming (the occupation of over nearly three-quarters of older people surveyed in every settlement). Of the 87% older people recording an occupation, over half (52% women 47%, men 67%) said they work full-time. Only 11% reported that they receive remittances (women 15%, men 4.5%) and 4% pensions. Remittances mostly come from children in Dar es Salaam or other towns– often to help cover the cost of caring for grandchildren left in the village, which may also explain why a higher proportion of women than men receive remittances. Remittances are commonly irregular, however, and thus may be more widespread than the survey data suggests. For men, as for women, they can play a critical role in survival: *They send money once or twice per month (from town). I use the money to pay for food and medical insurance* (Man 82y, Vikuge, living alone)

Although farming is the major livelihood source, older people estimate that they cultivate only one-half to one-quarter of their total land, because of their limited strength to cultivate, the expense involved in employing labour (which few can afford) and the cost of inputs (fertilizer and seed etc.): *I own 4 acres of land and cultivate only 1 acre (helped by his wife)… The problem is always my body gets tired* (man 73y). Moreover, over a third of respondents' farms are located over 30 minutes walk from home. Specific disability-associated reduced ability to work is reportedly relatively low (three-quarters record no disability), but an energy deficit, associated with age, poor health and possibly also limited access to food, is often evident. Many depend substantially on children and grandchildren to help with their farming. Those older people without immediate family resident nearby may face great difficulties: *For older people who have no grandchildren, lack of people to support them, they have to plead…* (Settlement leader, Kitomondo)

Transport in domestic contexts: load carrying and its implications.

Transport is required for a range of domestic tasks, notably moving water, firewood, refuse and farm produce within the village areas. Remarkably few older people in the survey (under 1%)

owned or used any form of cart or wheelbarrow, so pedestrian load-carrying is a major task. In the dry season water transport is a particular problem, in the absence of piped water in most settlements. Water has to be brought (usually twice daily) from locations over 30 minutes from the house in the case of 22% respondents, between 10 and 30 minutes walk from the house for 39% respondents. This journey can be difficult, given the (20kg) weight of the standard 20 litre container used. One woman described how she carries a small container on her back, putting it in a wrapper, as if carrying a baby, because of lack of strength. Among women surveyed, 70% carried all their water themselves, as did 47% of men (but men sometimes use a bicycle). The remainder had assistance from children, grandchildren and (where they do not have family nearby) neighbours. Water was carried every day by 43% of women and 30% of men: for those without family living close by, this can dominate the daily routine:
I don't have strength to go to farm but I try to fetch water. I don't have a child or grandchild here. I go just down there to the well. It takes quarter of an hour to fetch water – thirty minutes per journey. I do this three or four times a day… I carry in the gallons (brings out two gallon containers). I carry two but I cannot go all the way – I have to stop for rest and carry on, stop and carry on again. (woman c.80y, three children all dead, Vikuge). When this woman is sick she depends on neighbours to fetch water.

Since 94% of older people depend on firewood for fuel, this is another important item to consider when assessing domestic loads. Firewood is normally carried home just a few times each week, because it has to be brought over long distances from farm or bush. Over 70% of both women and men said they carry their firewood entirely by themselves: usually just one journey per day. It is remarkable that so many men report carrying wood for domestic use, given the stigma normally attached to this for men in Africa (Porter 2011). Nonetheless, more women than men talked about carrying firewood in in-depth interviews: *I carry the firewood on my head. I can carry 20pieces of fire woods which lasts for 3-4 days…. I harvest slowly by myself …. I can (spend) four hours (per day to) harvest.* (Woman 64y, living alone, Vikuge). The qualitative data shows that older people find carrying firewood extremely difficult, given its weight and many (especially the very old) tend to go out each day to find odd sticks and other biomass debris around the compound.

Load weights and perceived impacts: the loads which older people have to carry for domestic purposes have important potential implications for health. For a majority of women, the heaviest load they had carried in the previous week was water (30.5%) or firewood (29.6%): loads from the field (mainly food for home consumption) were only the heaviest load for 17.7% of women. Among men, firewood was generally the heaviest load carried (46.2%), with much less emphasis on water (21.8%) than in the case of women, but slightly more reference to loads from the field (21.2%). We asked for an approximation of the heaviest weight carried – the most common quantity cited was 20kg or 15kg (especially among those in their 60s and 70s). The load type carried most *often* (as opposed to the heaviest load), was water for women and farm produce for men, followed closely by water. Almost no loads were carried for money.

A majority of older people surveyed said they had experienced pain or tiredness problems which they associated with load-carrying: 66% of women and 74% of men reported headache and 57% of women and 75% of men had waist/back pain in the week prior to the survey which they associated with load-carrying. The *main* impact identified was as follows (table 3):

Table 3. Most important load-carrying impact in week prior to survey

	No problems	Head-ache	Waist/back pain	Tiredness
Women	22.2%	19.7%	29.1%	12.3%
Men	13.7	12.2	43.5	13.7
Total	18.9	16.8	34.7	12.9

There are also numerous references to pain in the qualitative interviews, for instance:
I carry heavy loads all the time, though due to my age nowadays I carry up to 20kgs but in the past I was able to carry even 30 -35kgs on my head. I do suffer … back pain, headache and neck-ache. If it is serious I go to the hospital, if not I only take pain killers. (Woman 68y, Kongowe)

Interestingly, data on children's load-carrying suggests, in line with the survey data above, that males suffer more than females, even though they often carry less (Porter et al. 2012). This is possibly partly a matter of differential pain perceptions by gender, but in some cases here may reflect earlier male roles as commercial porters. A response in the survey of 'no problems from load-carrying' increases gradually with age, presumably because older age groups are no longer expected or able to carry loads of any magnitude. However, it should be borne in mind that the older age groups comprise very small numbers of respondents and it is possible that those who have suffered most through load-carrying do not often live into their 80s and 90s.

Livelihoods, well-being and transport beyond the village

Older people's inter-settlement movements tend to revolve around visits to family and social events, occasional purchase of groceries or farm inputs, and health care. Produce trading is limited: given the size of cultivated plots, the majority do not have surplus to sell (especially those with young grandchildren to feed). Moreover, there is little transport available for carrying loads to the major roads and markets. Instead, those older people with a surplus tend to wait for traders to visit them, where they are likely to receive lower returns. In Msufini, young men also buy charcoal from them and take it to market. The older people reportedly sell it very cheaply at c. 5-6,000sh, whereas they would get more at the road – 8-10,000. Transport (by motorcycle-taxi) is expensive – 2,400sh for passengers and 1000sh for a load - so the young men use bicycles in order to realize a profit, whereas older men find cycling too difficult when loaded with charcoal. While motorcycle-taxis have very substantially improved general access in rural settlements and are especially valuable in emergency contexts, they cannot carry large loads at sufficiently low cost to enable most older people to accompany their harvested products to major markets.

Pedestrian travel dominates even for journeys outside the village. The main advantage of walking was reported to be its cheapness, the biggest disadvantage the fact that it is so tiring. *Cycling* is predominantly a male activity, though 35% of women (and 72% of men) reported that they own a working cycle. Ownership among women seems high, given how few women are to be seen cycling and the fact that 82% of women say they never use a bicycle, but this is probably because the cycles are used by children and grandchildren. According to a male settlement leader in Msufini, for instance: *Women don't ride bicycles…it is too far from here to Kongowe (to the maize mill) for a girl with a load …we are afraid to send a girl as maybe boys will do*

something bad to them on the way. Given the widespread disparity in cycling between men and women, girls and boys, across Africa, we asked respondents whether they knew how to ride a bicycle – 89% of men responded in the affirmative, but only 9% of women. Just 4% of women said they still regularly ride a bicycle, compared to 52% of men. We asked those who do not know how to cycle, why this is the case. For women the principal reasons were lack of a cycle (35% of women respondents) and lack of time to learn (23%). Only a few men were unable to cycle (7% of male respondents), principally because of lack of a bicycle on which to learn.

Although few respondents reported driving a motorcycle (under 1% of women and men), *motorcycle-taxis* are now a principal means of transport, especially in off-road villages. Many respondents use them on a regular basis to travel to nearby settlements, or to the roadside where they can catch a (cheaper) bus to more distant locations. In the week prior to the survey, 18% of women and 31.5% of men had used a motorcycle-taxi. There was no discernible age pattern, but usage was highest in Vikuge (where 45% of respondents had taken one in the previous week and only 2 respondents had never used one). The value of motorcycle-taxis is widely recognized by older people across the villages, in the absence of alternative motorized transport – it not only allows travel beyond the village, but also brings in goods which would otherwise be unavailable there*: bodaboda has improved my life … now it is simple to travel to (local market centre) and even to transport the farm produce to town. Not only that, many goods are now available at our village - the business men can now transport various goods so we do not need to travel to (market centre) frequently for shopping.* (Man 73y, Kitomondo). The 'never use' category is commonest in Kongowe (32% never use), the paved road settlement, because there are alternative, cheaper modes of motorized transport; possibly the heavy traffic also makes motorcycle riding seem particularly dangerous. However, even here we found keen proponents: *I like travelling by bodaboda because it takes me up to my home place… the buses (are more comfortable but) do not come up to our home places… and the buses are not available at night time.* (Woman 62y, widow living with daughter and grandchildren)

Motorcycle-taxis are valued for their speed in terms of getting to places quickly, but disliked for the speed at which the operators drive them (noted as the main disadvantage by 39% women and 36% men). Their other key disadvantage is cost (the main disadvantage for 39% women, 42% men). The principal danger associated with the motorcycle-taxis is traffic accidents (for 73% of women, 79% men). Qualitative data expand this picture. A man (68y) in Ngohingo, for instance, observed: *you are at the risk of getting accidents. Also my legs have problems so it becomes difficult for me to sit the bodaboda. After the journey I can stay four days suffering with leg pains*. Similarly a man (79y) in Vikuge complained: *When there is a need to go to Kongowe, I use boda-boda but the drivers are so rough and sometimes after the journey I get so much pain - back and legs pains.* The biggest complaint, however, in both the survey and qualitative interviews concerns cost, especially at night when fares usually rise substantially (as they also do when roads are particularly bad after heavy rains):

I have used bodaboda at night time when I was called by my friend …- her son was seriously sick suffering from malaria so I had to go see him. It is about two kilometers from here to my friend's house and the cost of transport was 1500sh (that is) 500sh more than the normal price. (Woman 66y, Soga)

Minibuses are clearly favoured by our respondents for their comfort (50% women, 49% men note this as the principal advantage) and their speed in getting to places (40% women, 30% men). However, their availability is poor. In qualitative interviews in Kongowe, the only settlement where minibuses present a viable alternative to motorcycle-taxi transport, respondents commented that they are cheaper, but even here there are many poor roads where other transport does not pass:

I like travelling by bodaboda because it takes me up to my home place. Travelling by buses or minibuses is more comfortable but it has some disadvantages - the buses do not come up to our home places…(and) are not available at night (Woman 62y, Kongowe)

Buses, like minibuses, are popular with respondents because of their comfort (51% women, 46% men) and speed in getting to places (44% women, 41% men), but they are viewed as expensive (41% women, 49% men) and speeding is still seen as a danger (23% women, 19% men). Again, 7% of respondents noted their low availability. Buses are used particularly for travel from Kongowe to Dar es Salaam: this journey costs 1,500sh by bus, compared to 10,000 by motorcycle-taxi.

Traffic accidents: Because of growing concerns about road safety, we asked about traffic and travel accidents: 90% of women and 77% of men had never experienced a traffic accident of any type; 9% of men had had a cycle accident as had 1% of women. However, 2.5% of women and 4% of men reported they had had a motorcycle accident – given the relatively recent introduction of motorcycles in the area, this figure is of concern. There is no clear pattern in accidents according to age. Occasionally, descriptions of accidents were given in qualitative interviews: one man was burnt by an exhaust pipe '*because I failed to sit properly'*, another man fell off because he was dozing. More often the accident is associated with speeding (most of the drivers are young men who clearly enjoy travelling at speed) or with a muddy road:

I was on my way to my home place from Kongowe - we were two passengers on the same bodaboda, so three people including the driver. The motorcycle slid down and I was injured at my left leg leaving me with a very big sore and it was so much painful and sufferings - thank God my bones were not affected. On that journey I didn't put on a helmet, you know here at Misufini only the drivers wear helmets but the passengers no. (Man 80y, Msufini)

This quotation raises a major issue now associated with motorcycle-taxi travel – the widespread absence of helmet-wearing. Drivers tend to own a helmet only for themselves (as required by law, though they rarely wear them), but many say that their customers will not wear a borrowed helmet because of the danger of 'fungus' (an issue also raised by some older people, though many would welcome a helmet). In one village the community has built ridges like rumble-strips on the road at the edge of the village and in the middle, to prevent speeding.

Finally, it is important to note the growth of mobile phones as a key communication tool in the study settlements – they are used in place of transport (when discussions can be conducted by phone instead of through face-to-face meeting), to order motorcycle-taxis, and to send money. This latter is a feature of growing importance, especially since it allows children in the city to easily send money to parents looking after grandchildren. Forty-nine percent of women and 58% of men reported a phone in their own home which is available for them to use, even if it is not

owned personally. Even where there is no phone in the household, respondents often have access to that of a neighbour or friend.

In terms of transport organisation, the combination of motorcycle-taxi services with mobile phone access has had remarkable impact over the last few years. It is clear that even though many older people do not enjoy travelling by motorcycle-taxi, when used in conjunction with mobile phones it offers enormous benefits, in terms of timeliness and speed of service. Moreover, a number of respondents observed in the qualitative interviews that they travel less overall than used to be the case, because of their access to phones. The positive and negative elements of these changes will be discussed in a separate paper.

REVIEW AND PROSPECT: THE INTERCONNECTIONS BETWEEN RURAL TRANSPORT, HEALTH, LIVELIHOODS AND WELL-BEING

Transport is clearly a major hurdle for many older people in the study settlements – particularly for their daily domestic water and fuel needs, but also for accessing health care. As we have shown, transport, health, livelihoods and well-being are interconnected in many respects. The long distance to water points is of particular concern, given older people's limited capacity to carry, since insufficient water access will contribute to water borne diseases including digestive problems, while limited awareness of hygiene associated with prevailing low education levels is likely to increase exposure to infection: the knock-on impacts of health may be considerable. Meanwhile, the prevailing poverty which results from low agricultural production and poor access to good markets (also associated, in part, with transport constraints) is likely not only to reduce nutritional status but also to impact on factors such as the ability to buy mosquito nets – possibly contributing to the high incidence of malaria.

It is important, however, to consider the diversity of older people, and how this impacts on their ability to access transport services. In terms of *socio-economic status*, most older people we interviewed are relatively poor compared to the community average, but there also appeared to be a few with above-average wealth in many, possibly all, settlements: this obviously affects ability to pay fares. There were also important differences associated with *residential location*, especially between those living in settlements close to the main paved road and those living in remote settlements with poor road access and consequently limited transport services. *Gender* seems to be a less significant factor shaping older people's access to transport than might have been predicted, though it particularly affects bicycle usage in the wider population. The impact of *age* within the wider older people age category was difficult to assess from the survey data, in part because numbers in the higher age groups are very low. The qualitative interviews suggests that while the very old are mostly highly immobile, they commonly receive substantial mobility support from family and – where family are absent- neighbours and the wider community. However, differential access to transport and mobility across age groups still requires emphasis.

The relationality between older people and their children and grandchildren is strongly displayed in this mobilities context. It is a key redeeming feature in many families and communities (though for older people without immediate resident family, conditions can be harsh). The mobility patterns of diverse age-groups are often intimately bound together, as older people care

for grandchildren, while locally resident children and grandchildren assist, in turn, with older people's access to goods and services, including medicines and domestic needs. This symbiotic relationship between generations allows many to cope in difficult situations (the need for young adults –the parents - to migrate to the city for work; the high incidence of HIV/AIDS). This pattern is probably reproduced across much of rural Tanzania and beyond, though evidence is lacking.

The information presented in this study also suggests potential foci in an agenda for action. In terms of transport interventions, particular attention is needed to reducing current domestic load-carrying burdens. Since this burden also affects younger age-groups, with potentially damaging effects, interventions focused on older people could have wide impact. They would be best focused not only on developing suitable Intermediate Means of Transport, possibly including adaptation of motorcycle-taxis for transporting intra-village water and firewood, but also on increasing the number of boreholes and local firewood plantations. So far as improvements to inter-village transport services are concerned, the role of motorcycle-taxis requires immediate attention. It is important to explore if/how they might be adapted to ensure safer, more comfortable travel for older/sick people, and to examine feasible alternatives, especially regarding older people's travel to health centres. A pilot action research study could be valuable, for instance, in introducing a community-run emergency health service, with a small fund to provide fares for emergency treatment, mobile phones and an improved motorcycle-taxi passenger seating arrangement. In promoting such interventions, it will be important to emphasise the broader benefits of paying attention to older people's transport needs, given competing demands on constrainted resources. As this paper has demonstrated, mobilities of different age groups are complexly intertwined: interventions to assist older people can contribute substantially to wider community and national development.

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Appendix 1: ***Road access, transport and local service availability***

Settlement	**Road access**	**Surveyed Older People homes located over 15 mins walk from regular transport**	**No. of motorcycle-taxi operators**	**Other motorised transport regularly available**	**Market**	**Grinding mill**
Boko	Usually passable	5%	c. 25	One vehicle available in emergencies?	No, nearest market 12 km	No, nearest at Soga (6km)
Kitomondo	Sometimes impassable in rains (March-June)	0%	10	None	No, go to Mlandisi	No, nearest is at Ruvu
Kongowe	On paved road	0%	Very large no.	Yes, buses, minibuses	Yes	3 small mills
Msufini	Difficult in rains (April-May)	38%	8	None	No	No, take maize to Kongowe or Soga
Ngeta	Usually passable	54%	20	Train to Mwanza stops here Tues, Fri	No, go to Mlandisi (16 km distant)	No, take to Mlandisi
Ngohingo	Usually passable	5%	5	None	No	No (broke 2 years ago, take to Kingowe)
Minazi	Seasonal - impassable on black cotton soils in rains (March to May)	22%	16	None	No, go to Mlandisi	No, take to Mlandisi or Dar
Mwanabwito	Sometimes impassable in rains	20%	6	None	No, go to Mlandisi	No, take to Mlandisi or Dar
Soga	Difficult in rains	24%	12 or more	None	No, go to Mlandisi	2 mills
Vikuge	Usually passable (Short-term problems on Kongowe road in rains -badly potholed near Kongowe)	4%	c. 20	A pilot bus service (Vikuge-Soga) reportedly withdrawn as people took motorcycle-taxis instead of waiting for the bus	No, nearest at Kongowe	No, take to Kongowe (6 km)